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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yutaka Okamoto

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EXAMINER

DAVIDSON, DAN

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/796,169	<b>Applicant(s)</b> OKAMOTO ET AL.	
	<b>Examiner</b> DAN I. DAVIDSON	<b>Art Unit</b> 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9 and 14-18 is/are rejected.
- 7) ☒ Claim(s) 5, 10-13 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :03102004; 05022005; 11292006; 11202007.

### **DETAILED ACTION**

1. The information disclosure statements filed March 10, 2004; May 2, 2005; November 29, 2006; and November 20, 2007 have been received and have been considered and made of record.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 4 and 6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The last limitation in claim 4 that the prediction unit outputs a determination signal indicative of the leading position when an amplitude value of the read signal (containing data recorded in a data field) indicates a preset expected value is not supported by the specification. However, as accurately stated in claim 12, it is the amplitude value of the phase difference detection signal that results in determination of the leading position, not the amplitude value of the read signal of data recorded in the data field. Claim 6 is rejected since it depends on claim 4.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 7-9, and 14-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Sawada et al (US 6,600,779 B1).

Re claims 1-2 and 7; Sawada et al disclose a disk drive (Fig. 6) comprising: a disk medium (Fig. 6, 33); a read head which reads a read signal from the disk medium (Fig. 6, 34), the read signal containing data recorded in a data field on the disk medium, a sync pattern used to detect a leading position of the data field, and a preamble area (Fig. 27); a binary data generation unit which generates, from the read signal (RD), a binary data sequence from the read signal, the binary data sequence corresponding to the data and the sync pattern (Fig. 58, output of 215; Fig. 60, note that the bits have values of "0" and "1"); and a sync detection unit including a prediction unit which uses the read signal to determine the leading position of the sync pattern (i.e. the end signal for the preamble area) (Fig. 58, 252; col. 40, lines 20-22; as is made clear at page 18, lines 7-9 of the specification, the end position of the preamble area is the leading position of the sync pattern) and detects the sync pattern in the binary data sequence in accordance with a result of the detection (Fig. 58, 251, SB2). Sawada et al further disclose a read channel which processes the read signal to reproduce data (Fig. 58, 243, RD) and which includes the binary data generation unit (Fig. 58, 215) and the sync detection unit (Fig. 58, 252, 251).

Re claim 3; Sawada et al disclose a decoding unit which decodes the data from the binary data sequence (Fig. 58, 225) in accordance with a detection signal for the sync pattern from the sync detection unit (col. 3, lines 43-46; the data is decoded as recorded data in accordance with the sync byte detection signal).

Re claim 8; Sawada et al disclose that the read channel includes, in front of the binary data generation unit (Fig. 58, 215), a timing signal generation unit (Fig. 58, 221) which generates a timing signal required for a data reproduction process, from a part of the read signal corresponding to the preamble area (Fig. 58, CLK; col. 39, lines 19-22), and wherein the prediction unit generates the end signal for the preamble area using the signal outputted by the timing signal generation unit (Fig. 58, 221, 252; col. 40, lines 20-22).

Re claim 9; Sawada et al further disclose an A/D converter which converts an analog signal waveform of the read signal into a digital signal (Fig. 59, 222), wherein the timing signal generation unit includes a phase difference detection unit which receives the digital signal outputted by the A/D converter as an input to detect a phase difference between the timing signal required for the data reproduction process and the part of the read signal corresponding to the preamble area (Fig. 59, 223; col. 3, lines 19-22), and wherein the prediction unit generates the end signal for the preamble area using a phase difference detection signal outputted by the phase difference detection unit (Fig. 59, 223, CLK; col. 40, lines 20-22; since the prediction unit generates the end signal for the preamble area (i.e. the leading position of the sync pattern) using the CLK signal which is determined based on a phase difference detection signal, this limitation is met).

Re claim 14; the limitations at this claim are satisfied since the limitations are drawn towards a method of detecting a sync mark using the structural limitations of a disk drive claimed in claim 1.

Re claim 15; the limitation at this claim is satisfied since the limitation is drawn towards a method of detecting a sync mark using the structural limitation of a disk drive claimed in claim 3.

Re claim 16; Sawada et al disclose that the binary data sequence (Fig. 59, 219) is compared with a reference data sequence corresponding to the sync pattern (Fig. 59, 255), and a detection signal for the sync pattern is generated when a result of the comparison indicates that the data sequences are matched (Fig. 59, 253, SB2), and wherein the detection signal for the sync pattern is outputted using a determination signal indicative of the leading position of the sync pattern (Fig. 59, TRG; col. 40, lines 15-20).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada et al (US 6,600,779 B1).

Sawada et al disclose the limitations at claim 14, from which claims 17 and 18 depend, as discussed above.

Sawada et al fail to disclose generating an end signal for a preamble area on the disk medium in order to determine the leading position of the sync pattern using the read signal (up to this point, the Examiner has interpreted an end signal for a preamble area to be the leading position of the sync pattern since the sync pattern directly follows the preamble area; see Figure 27). Official Notice is taken that one of ordinary skill in the art at the time of Applicant's invention would have been able to count one less clock signal in Sawada et al to generate an end signal for a preamble area instead of determining the leading position of the sync pattern and then adding a single clock signal after generating the end signal for the preamble area to determine the leading position of the sync pattern, a process that would satisfy the first limitation at claim 17. It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to substitute the process in Sawada et al for determining the leading position of the sync pattern with the above process described in the Official Notice for the predictable result of determining the start of the sync pattern.

The remaining limitation at claim 17 is satisfied based on the discussion above with respect to the last limitation at claim 14.

Re claim 18; the limitations at this claim are satisfied since the limitations are drawn towards a method of detecting a sync mark using the structural limitations of a disk drive claimed in claim 8.



***Allowable Subject Matter***

8. Claims 5, 10-13, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claims 5 and 11; the prior art of record, and in particular Sawada et al (US 6,600,779 B1) which is the closest prior art of record, fails to teach or suggest all of the claimed limitations in combination, specifically including the limitation of an output control unit which outputs a sync detection signal in accordance with the result of determination indicative of the leading position of the sync pattern. In Sawada et al, once the comparison between the binary data sequence with a reference data sequence corresponding to the sync pattern indicates that the data sequences are matched, the sync detection signal is output without provision for an output control unit that operates in accordance with a determination of the leading position of the sync pattern (i.e. end signal of the preamble) (see Fig. 59 of Sawada).

Re claims 10 and 19; the prior art of record, and in particular Sawada et al (US 6,600,779 B1) which is the closest prior art of record, fails to teach or suggest all of the claimed limitations in combination, specifically including the limitations of a digital equalization unit which receives the digital signal outputted by the A/D converter as an input and executes a digital waveform equalization process, and wherein the prediction unit generates the end signal for the preamble area using a signal outputted by the digital equalization unit. Claim 19 is a method claim that corresponds to claim 10.

Re claim 12; the prior art of record, and in particular Sawada et al (US 6,600,779 B1) which is the closest prior art of record, fails to teach or suggest all of the claimed limitations in combination, specifically including the limitation that the prediction unit compares an amplitude value of the phase difference detection signal outputted by the phase difference detection unit with a present expected value and outputs the end signal for the preamble area when the amplitude value indicates the expected value.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Zook (US 5,793,548 A) teaches refining detection of a sync pattern by enabling its detection only at times that represent a delay from potential end bits of the preamble area. However, no detection of the end bit of the preamble area (the leading bit of the sync pattern) is made.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAN I. DAVIDSON whose telephone number is (571)272-7552. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea L. Wellington, can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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May 8, 2008